

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Docket No: Q94561

Yoshiyuki Takase

Serial No.: 10/579,790

Art Unit: 1767

Filed: May 18, 2006

Examiner: BUIE-HATCHER, NICOLE M

Title: Process for production of fluorine-containing  
polymers and fluorine-containing polymers

DECLARATION UNDER RULE 132

Honorable Commissioner of Patents and Trademarks,  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Yoshiyuki Takase, a citizen of Japan and having  
postal mailing address of c/o DAIKIN INDUSTRIES, Ltd.,  
Yodogawa Plant. 1-1, Nishihitotsuya, Settsu-shi, Osaka  
566-8585 JAPAN, declare and say that:

I was graduated from Doshisha University and  
received a master Degree in chemical engineering in March  
1999;

I am one of the inventors of the above-identified  
application and familiar with the subject matter thereof;

I have read the Official Action mailed and the  
references cited therein and I am familiar with the  
subject matter thereof;

I respectfully submit herewith my exact report  
thereon.

The following experiments were conducted by me or under my direct supervision.

#### Reference Example 2

This example illustrates the number of unstable terminal groups when the fluoropolymer of which polymer terminal groups are  $-\text{CF}_2\text{H}$  is subjected through an extruder.

Sample-A used in this example was as follows. (All measured per the disclosure of the specification.)

Table 2

Monomer ratio	TFE/HFP = 87.5/12.5 (mole%)
MFR	16.6 g/10min
Number of $-\text{CF}_2\text{H}$	430 groups/ $10^6$ carbon atoms
Number of $-\text{COF}$	0 groups/ $10^6$ carbon atoms
Number of $-\text{COOH}$	4 groups/ $10^6$ carbon atoms
Volatile matter index	35
Total metal content	$\leq 1\text{ppm}$

Sample A was fed to the hopper of a twin-screw extruder (manufactured by Japan Steel Works, shaft diameter = 32 mm, L/D = 31.5), and melt-kneading was carried out at 370°C (cylinder temperature). The first barrel of the extruder was used as a feeding zone and the 8th barrel as the venting (degassing) zone. The screw revolution rate was set at 150 rpm or 400 rpm. The throughput was set at 20 kg/hour. The fluoropolymer

melt-extruded was subjected to strand cutting to give pellets B and C.

The results are shown in Table 3.

Table 3

	Screw revolution rate (rpm)	Shear rate (s <sup>-1</sup> )	MFR (g/10min)	-CF <sub>2</sub> H (groups /10 <sup>6</sup> carbon atoms)	-COF (groups /10 <sup>6</sup> carbon atoms)	-COOH (groups /10 <sup>6</sup> carbon atoms)	Volatile matter index
Sample A	-	-	16.6	430	0	4	35
Pellet B	150	6029	16.7	-	25	13	24
Pellet C	400	16077	24.8	-	37	23	12

The results in Table 3 show that the process taught by Morgan et al. reduced a volatile matter index. However, the fluoropolymer obtained had larger number of unstable terminal groups as compared to Sample A. It was revealed that unstable terminal groups were reformed by the process taught by Morgan et al.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Signed this / th day of March, 2011

Yoshiyuki Takase  
Yoshiyuki Takase